APPENDIX III

EVALUATION OF AIR TEMPERATURE MEASUREMENTS MADE WITH THE TELATEMP AG 42 INFRARED THERMOMETER

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One of the features of the Telatemp Ag 42 Infrared Thermometer is its capacity to calculate the difference between crop temperature and ambient air temperature (ΔT) through the use of a small bead thermocouple. Ambient air temperature can then be calculated.

We tested the accuracy of the Ag 42 measurement by comparing the air temperature calculated from the Telatemp with air temperature measured with constantan-evanohum thermocouples at three meters above the soil surface in a corn canopy. This is the same height from which crop temperature and ΔT measurements were made. Data were collected at mid-day on 14 days in 1979. Results indicate that there is a strong tendency for the Telatemp to overestimate air temperature by 1 to 2 C. This overestimation is probably a function of windspeed. At lower windspeeds, ventilation will be inadequate, resulting in a biased temperature estimate with the Telatemp.

We feel that at moderate windspeeds the ΔT measured by the Ag 42 may be sufficiently accurate (1 to 2 C) for general estimates of air temperature. The accuracy needed for precise field research is not provided, however.

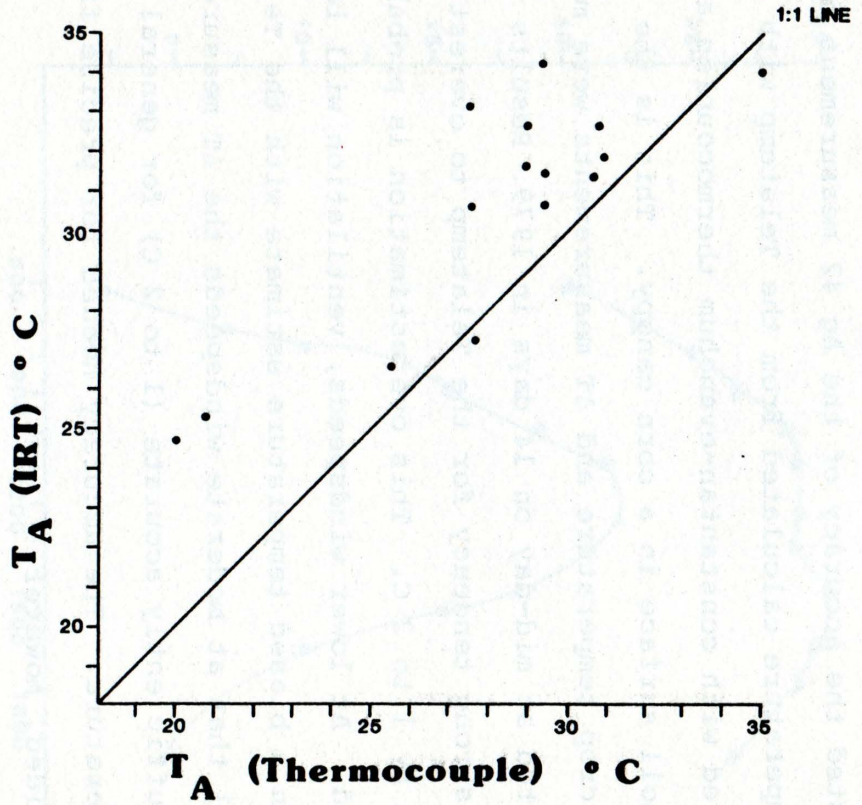

Fig. 1. Comparison between mid-day air temperature (TA) at three meters as with a radiation shielded thermocouple and with a small bead thermocouple on the Telatemp Ag 42 Infrared Thermometer.